

MILNER

Application No. 10/089,562

July 18, 2005

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes Fig. 1, replaces the original sheet including this figure. In Fig. 1, appropriate labels have been added to block diagrams 105 and 109.

Attachment: Replacement Sheet(s)
Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

Reconsideration and allowance of this application are respectfully requested. Currently, claims 13-26 are pending in this application.

Rejection Under 35 U.S.C. §103:

Claims 1-10 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Jacobs et al (WO 95/17746, hereinafter “Jacobs”) in view of Callens et al (U.S. ‘277, hereinafter “Callens”). Claims 1-10 have been canceled. Applicant submits that new claims 13-26 are not “obvious” under 35 U.S.C. §103 over Jacobs in view of Callens.

In order to establish a prima facie case of obviousness, all of the claim limitations must be taught or suggested by the prior art. The combination of Jacobs and Callens fails to teach or suggest all of the claim limitations. For example, the combination fails to teach or suggest, *inter alia*, “generating an estimated replacement feature vector for the detected absent feature vector by converting a received differential feature vector to a spectral domain, estimating a spectral component of said feature vector by interpolating the corresponding component of the converted feature vector, and converting the estimated spectral component to said parameterized domain of the frequencies of the speech signal,” as required by independent claim 13 and its dependents. Similar comments apply to independent claim 21 and its dependents.

The present invention relates to parameterizing a speech signal in a first domain and then converting the parameterized signal from the first domain into a spectral domain to perform an estimation of any missing feature vectors in the spectral domain, and then converting back the parameterized signal for transmission to a feature processor for speech recognition. In an exemplary embodiment of the present invention (see dependent claims 14 and 22) the parameterized domain (i.e., the first domain) comprises a cepstral domain. The parameterized feature vectors may thus be cepstral feature vectors which are obtained by processing the basic features of the speech signal to determine the rate of change of the frequencies of the speech signal with respect to time. However, as is apparent from the specification, the feature vectors may be obtained by alternative processing techniques, in which case the parameterized features comprise differential features such as “velocity” or “acceleration.”

Neither Jacobs nor Callens discloses converting a feature vector from a first parameterized domain to the spectral domain prior to performing an interpolation, and then converting back from the spectral domain to the parameterized domain to provide a sequence of feature vectors in the parameterized domain to a feature processor. According, even if Jacobs and Callens were combined as proposed by the Office Action, the combination would not have taught or suggested all of the claim limitations. Neither of these references alone or in combination appreciate the advantages provided by the present invention, namely that the feature vectors

can be estimated in a more computational efficient manner (i.e., more rapidly) if converted to the spectral domain, interpolated, and regenerated. This is highly advantageous in any real-time speech transmission scenario. Moreover, Applicant submits that one of ordinary skill in the art would not have been motivated to combine Jacobs (which relates to using a word decoder to determine syntax) and Callens (which relates to the different field of detecting error transmissions).

Applicant notes that the International Preliminary Examination Report (IPER) discusses Jacobs as document D1 and Callens as document D2. Section V(3.) of the IPER states the following:

“Claim 4 is new and involves an inventive step. Claim 4 claims an estimating step which converts a received cepstral feature vector into spectral domain for the purpose of interpolation and, thereafter, converts an estimated spectral component back to said cepstral domain. As a result, the subject-matter of claim 4 distinguishes from the prior art and, furthermore, is non-obvious to a skilled person.

Since apparatus claim 8 corresponds to method claim 4, claim 8 is new and inventive as well.”

Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. §103 in view of Jacobs and Callens be withdrawn.

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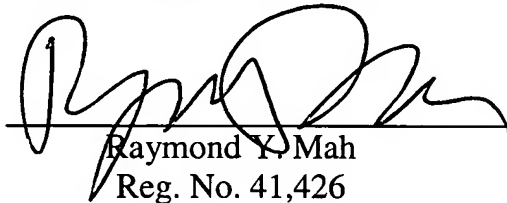
Conclusion:

Applicant believes that this entire application is in condition for allowance and respectfully requests a notice to this effect. If the Examiner has any questions or believes that an interview would further prosecution of this application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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